

# Beamline 5-ID / DND-CAT

**Scientific focus:** Crystallography, EXAFS, polymer scattering, and surface science

**Scientific programs:** Materials science and engineering, polymer science, crystallography, surface science, and catalysis

## Optics & Optical Performance

- 7–18 keV spectral range
- cryogenic Si(111) crystals  
fixed-gap channel cut configuration
- energy range limited due to crystal size

## Experiment Stations

### 5-ID-B

- monochromatic general-purpose beam station
- 4-circle Huber goniometer
- Mar CCD
- single-crystal diffraction
- EXAFS

### 5-ID-C

- monochromatic beam station
- surface science using custom UHV system
- surface scattering
- standing waves

### 5-ID-D

- small- and wide-angle scattering
- polymer scattering station

## Detectors

- spectroscopy-grade ionization chambers
- Lytle detector
- Fuji BAS 2000 image-plate system
- scintillation detectors
- Mar 135 mm CCD detector
- Spectra Source CCD camera for imaging applications
- EG&G Ortec Iglet solid-state detector

## Beamline Controls and Data Acquisition

- Linux running custom control code for motors and actuators for all systems
- SPEC used to control diffractometers and surface-science instruments
- Vendor-supplied software used to control CCD detectors

## Beamline Support Equipment/Facilities

- 6-circle diffractometer
- 2-circle powder diffractometer
- custom UHV system
- Mar CCD detector system
- Fuji BAS 2000 image-plate system

## Insertion Device Source Characteristics (nominal)

source	Undulator A
period	3.30 cm
length	2.47 m
effective $K_{\max}$ (at minimum gap = 10.5 mm)	2.78
energy range 1st harmonic	2.9 - 13.0 keV
energy range 1st - 5th harmonics	2.9 - 45.0 keV
on-axis peak brilliance at 6.5 keV	$9.6 \times 10^{18}$ ph/sec/mrad <sup>2</sup> /mm <sup>2</sup> /0.1% bw
source size at 8.0 keV $\sum_x$ $\sum_y$	$359 \mu\text{m}$ $21 \mu\text{m}$
source divergence at 8.0 keV $\sum_{x'}$ $\sum_{y'}$	$24 \mu\text{rad}$ $6.9 \mu\text{rad}$